The applicant appreciates the indicated allowability of claims 7, 24, 25 and 31 if rewritten in independent form. Claims 7, 24 and 31 have been rewritten in independent form, so it is believed that claims 7, 24, 25 and 31 are now allowable.

The specification has been amended to consistently refer to sleeve coupler 26.

Claims 1, 2, 4, 6, 8, 10, 14, 15, 19, 20 and 35 were rejected under 35 USC §102(b) as being anticipated by Chang ('084). This basis for rejection is respectfully traversed.

Claim 1 has been amended to clarify that the crank arm has a crank axle mounting hole around a rotational axis and that the drive member is supported coaxial with the rotational axis. Claim 35 has been amended to clarify that the crank axle mounting boss includes a crank axle mounting hole and a rotational axis, wherein two abutments rotate coaxially around the rotational axis. Chang discloses a one-piece crank arm/axle assembly that employs an annular retainer 31 with protruded blocks 355. As such, Chang neither discloses nor suggests a crank arm with a crank axle mounting hole that allows the crank arm/ and drive member to be used with a different axle assembly.

Claims 1, 2 and 6 were rejected under 35 U.S.C. §102(b) as being anticipated by Guiles ('658). This basis for rejection is respectfully traversed.

As noted above, claim 1 has been amended to clarify that the drive member is supported coaxial with the rotational axis. The collar 9 in Guiles clearly is not supported coaxial with the rotational axis defined by axle 1. Thus, Guiles neither discloses nor suggests the subject matter of claim 1.

Claims 21-23 were rejected under 35 USC §103(a) as being unpatentable over Chang in view of Browning ('794). This basis for rejection is respectfully traversed.

Claims 21-23 should be patentable for the same reasons noted above when discussing the rejection of claim 1 as being anticipated by Chang.

Claims 32 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over Chang. This basis for rejection is respectfully traversed.

Claims 32 and 36 should be patentable for the same reasons noted above when discussing the rejection of claim 1 as being anticipated by Chang. Furthermore, claim 36 recites the abutment rotating around the rotational axis, and Chang's protruded blocks 355 do not rotate.

Accordingly, it is believed that the rejections under 35 USC §102 and §103 have been overcome by the foregoing amendment and remarks, and it is submitted that the claims are in condition for allowance. Reconsideration of this application as amended is respectfully requested. Allowance of all claims is earnestly solicited.

Respectfully submitted,

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VERSION OF AMENDMENTS WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

The paragraph beginning at page 4, line 16 has been amended as follows:

Fig. 1 is a partial cross sectional view of a bicycle bottom bracket assembly 10 that incorporates a particular embodiment of an assisting apparatus 14 according to the present invention for shifting a bicycle transmission. Bottom bracket assembly 10 includes a bottom bracket shell 18 that is mounted to a typical bicycle frame (not shown), a tubular axle supporting sleeve 22, a sleeve coupler 26, an axle 30, ball bearings 34 and 38, and crank arm assemblies 42 and 46. Axle supporting sleeve 22 has a radially outwardly extending flange 50 on a first end thereof for retaining a mounting member 300 of assisting apparatus 14 to bottom bracket shell 18, bearing surfaces 58 and 62 for engaging ball bearings 34 and 38, respectively, and an outer peripheral surface 66 at a second end for engaging an inner peripheral surface 70 of sleeve coupler 26. Sleeve coupler [70] 26 includes a radially outwardly extending flange 74 for engaging the side of bottom bracket shell 18.

IN THE CLAIMS

Claims 1, 7, 24, 31, 35 and 36 have been amended as follows:

1. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:
a crank arm having a crank axle mounting hole around a rotational axis; and
a drive member supported coaxial with the rotational axis and including:
a first abutment facing a forward rotational direction of the crank arm; and
a non-concave first sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm.

7. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis; and

a drive member comprises an annular drive ring mounted around the rotational axis and including:

a first abutment facing a forward rotational direction of the crank arm; and

a non-concave first sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm; and

[The drive mechanism according to claim 6] wherein an inner peripheral surface of the drive ring includes a plurality of drive ring splines, and wherein an outer peripheral surface of the crank arm includes a plurality of crank arm splines that engage the plurality of drive ring splines.

24. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis;

wherein the crank arm includes a sprocket mounting member for mounting a sprocket to the crank arm;

a large diameter sprocket retained to the sprocket mounting member;

a small diameter sprocket retained to the sprocket mounting member; and

a drive member including:

a first abutment facing a forward rotational direction of the crank arm; and

a non-concave first sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm;

[The drive mechanism according to claim 23] wherein the large diameter sprocket includes a shift assist mechanism for assisting travel of a chain between the small diameter sprocket and the large diameter sprocket.

31. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a crank arm having a rotational axis; and

a drive member including:

a first abutment facing a forward rotational direction of the crank arm; and

a non-concave first sloped surface extending from a radially outer portion of the abutment and facing a rearward rotational direction of the crank arm;

[The drive mechanism according to claim 1] wherein the crank arm has a crank axle mounting hole, and further comprising a plurality of splines disposed in the crank axle mounting hole.

35. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a bicycle crank arm having a crank axle mounting boss including a crank axle mounting hole and a rotational axis; and

only two abutments disposed on an outer surface of the crank axle mounting boss and facing a forward rotational direction of the crank arm;

wherein the two abutments rotate coaxially around the rotational axis.

36. (Amended) A drive mechanism for a bicycle transmission assist mechanism comprising:

a bicycle crank arm having a crank axle mounting boss including a crank axle mounting hole and a rotational axis; and

a drive member disposed at the crank axle mounting boss and including:

an outer peripheral surface;

wherein an abutment is disposed on the outer peripheral surface and [facing] faces a forward rotational direction of the crank arm;

wherein the abutment rotates around the rotational axis at a substantially constant radius; and

wherein the outer peripheral surface at a location of intersection with a radially inner portion of the abutment extends convex for at least 20°.